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Root Cause Analysis Webinar
Q&A with Roni Silverstein
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Root cause analysis is a powerful method schools use to analyze data to solve problems; it aims to identify and correct the root causes of problems or events, rather than simply addressing their symptoms. In this webinar, veteran practitioner, Roni Silverstein, talked about the value of this process and practical ways to use it in your school or district. This Q&A addressed the questions participants had for Roni Silverstein following the webinar. The [webinar recording](#) and [PowerPoint presentation](#) are also available.

About Root Cause Analysis

- **What is RCA?**

Root Cause Analysis (RCA) is a method of problem solving that tries to identify the root causes of faults or problems rather than just treating symptoms. The *Patient Safety Primer on Root Cause Analysis*,¹ prepared by the U.S. Department of Health and Human Services, Agency for Healthcare, Research and Quality, describes RCA as:

A structured method used to analyze serious adverse events. Initially developed to analyze industrial accidents, RCA is now widely deployed as an error analysis tool in health care. A central tenet of RCA is to identify underlying problems that increase the likelihood of errors while avoiding the trap of focusing on mistakes by individuals. The goal of RCA is thus to identify both active errors (errors occurring at the point of interface between humans and a complex system) and latent errors (the hidden problems within health care systems that contribute to adverse events).

- **How long has this process been in use?**

RCA arose as a formal study in the 1950s. The National Aeronautics and Space Administration used it in the highly complex arena of rocket design and launching. RCA is now widely used in medicine, space, industry, engineering, science, and education.

- **How does an RCA support student achievement?**

RCA contributes to student success because the process:

- Is an equitable practice that reduces hunches and replaces the bandwagon approach with a cause and effect process.
- Aligns analysis with desired results.
- Directs the allocation of resources to the area of need.
- Builds professional learning communities.
- Establishes a culture of respect and collaboration, where staff members are willing to examine their own practices and beliefs.

- Develops a school culture that encourages and takes advantage of the knowledge and talents of staff and community.
- Encourages staff to work together to prescribe new practices that improve student achievement.

¹ <http://webmm.ahrq.gov/primer.aspx?primerID=10>

How does RCA align with other problem-solving approaches?

- **RCA reminds me of the “Problem Analysis” step of the 4-Step Problem-Solving Process often used as part of an RTI/Multi-Tiered System of Support framework. The 4 steps are: Problem- Identification, Problem Analysis, Develop & Implement an Intervention, and then Evaluate the Effectiveness of the Intervention. I think schools could build in some of these strategies (e.g., 5 Whys) to improve their problem-solving process.**

I agree that the entire RCA fits perfectly in the first three steps. It is a way to deeply analyze the problem before developing and implementing interventions.

- **We are following the Lean Six Sigma DMAIC approach for root cause and problem solving.
How does the method described in the webinar align with this?**

The iSix Sigma approach, which uses the 5 Whys to determine the root cause, aligns with the “Drilling Down Method” described in the webinar. The Drilling Down Method is a deeper look into a given problem; it depends on multiple questions, analysis, and data collection relative to those questions. The method then looks carefully at factors that may contribute to—but not be the root cause of—the problem. The 5 Whys process seems to work better when there are fewer factors to consider and fewer variables to control. iSix Sigma describes this technique as “a great tool that does not involve data segmentation, hypothesis testing, advanced statistical tools, and in many cases can be completed without a data collection plan.”²

- **What are the five Whys?**

The 5 Whys is a process for determining the root cause of a problem without statistical analysis. It is especially helpful in day-to-day business life. The Six Sigma improvement process² states:

By repeatedly asking the question, “Why” (five is a good rule of thumb), you can peel away the layer of symptoms which can lead to the root cause of a problem. Very often the ostensible reason for a problem will lead you to another question. Although this technique is called “5 Whys,” you may find that you will need to ask the question *fewer* or *more* times than five before you find the issue related to a problem.

- **How is RCA related to using logic models?**

A logic model is a way of laying out and linking together a program’s principles, activities/processes, short-term outcomes, and long-term outcomes. The process of putting together a logic model involves processes similar to those used in RCA, particularly in trying to identify the underlying assumptions and mechanisms for action. Like an RCA, a logic

model is a set of hypotheses or propositions about how something works, and has to be tested (e.g., by implementing corrective actions, starting an initiative, or conducting a research study) to evaluate its accuracy. A good resource for logic modeling is the W.K. Kellogg Foundations' Logic Model Development Guide (<http://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide>).

How does one conduct an RCA?

- **What is the process for identifying and prioritizing issues that will be addressed in an RCA?**

Before an RCA, the team must carefully define the problem it wants to address. This is done by examining data to find the most significant student need.

² <http://www.isixsigma.com/tools-templates/cause-effect/determine-root-cause-5-whys/>

The accepted process for conducting an RCA is:

- Define the problem—we call this identifying the student need (using data).
- Form a team to ask questions about what more you need to know (collect more data).
- Discuss the data to determine findings or identify **possible** causal factors.
- Identify the root cause—why does the causal factor exist; what is the reason?
- Recommend solutions to address the factors you identified.

The *Patient Safety Primer on Root Cause Analysis* prepared by the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, states:

RCA should generally follow a pre-specified protocol that begins with data collection and reconstruction of the event in question through record review and participant interviews. A multidisciplinary team should then analyze the sequence of events leading to the error, with the goals of identifying how the event occurred (through identification of active errors) and why the event occurred (through systematic identification and analysis of latent errors)...The ultimate goal of RCA, of course, is to prevent future harm by eliminating the latent errors that so often underlie adverse events.

- **How do you engage parents and students?**

Parents and students can be a part of the leadership team. Data can also be presented at PTA meetings and in communications to parents about the year's School Improvement Plan.

- **I understand that if the leadership team does the RCA, you can share the results with other teachers, students, and parents to do a less labor-intensive version and see if they arrive at similar conclusions. Then the leadership team can go back and use those causes to determine what actions need to take place and go back to staff to have them give their input. But how do you make sure that even if you do this, you're not just ending up with everyone's shared assumptions?**

RCA is the relentless questioning of the status quo. Staff can try new teaching methods and

test their theories in a culture of respect and safety. In the process, many voices need to be heard, including the teachers, para-educators, administrators, parents, and students. This broad questioning allows for an honest examination of the data and provides a much deeper analysis of the issues causing the problem.

- **How do you train people to do RCA? The fishbowl technique might be one way.**

The fishbowl method would be an excellent technique. We do the RCA analysis together, first with our leadership team, and then the team leaders help us lead the entire staff. The teachers can then use the strategies at their team meetings as they examine student work and formative assessments.

- **How do you get teachers to really drill down to the level in their data that they are looking at the root causes for student performance?**

In my school, we have data discussions monthly, looking at formative data for each individual class. We monitor the targeted students more closely, ensuring that interventions are working and changing support if the student is not improving. We also have a Data Team that meets monthly to look at each grade level's students to provide school-wide support to ensure that we pay close attention to the students who were identified in our School Improvement Plan.

- **How much time does RCA take?**

RCA could take a number of hours over a few days, or it can be a series of short sessions. We use our summer leadership days to conduct a full RCA. It may take a few hours each day. Then we bring our results to our staff during our pre-service days at the beginning of the year. We then spend most of a morning, examining student data and reviewing the RCA process and then having the whole staff add to our process, look at the leadership's conclusions, and provide more information.

- **When and how often should RCA be done?**

RCA should be done at least once per year. We also revisit our School Improvement Plan, which is based on the conclusions of the RCA, at least three times per year. In my school's case, we are going to continue with the assumptions gathered last year, but seek new research and outside support to provide additional guidance to address the root cause.

- **Is there a decision support matrix or problem-solving routine that can be used as templates?**

Yes. See the webinar resources for download, which are available at <https://www.relmidatlantic.org/content/root-cause-analysis-webinar>. The Fishbone

Diagram³ is another template that helps you explore potential reasons or causes that result in a single problem. Once the information is put on the Fishbone Diagram, you can use the 5 Whys process to drill down to the root cause. You can also use the drilling down process if there are many factors.

- **Please share some successful examples of RCA.**

Here is one example (see webinar recording⁴ for others):

We found that reading data showed declines for our special education and Hispanic students. It would be easy to decide the students needed more interventions, they needed more pull-out, their accommodations were incorrect, etc. However, on examination of the problem using the RCA process, we concluded that students did not understand the vocabulary of the questions nor of the reading material. Staff also determined that some students were very frustrated and lacked persistence. Specific techniques were put into place to pre-teach important vocabulary before reading the stories. In addition, vocabulary was shared with the ESOL teachers, the para-educators working with the targeted students, the special educators working with these students, and the parents. Time was allotted during guided reading to look at vocabulary, as well as to teach students ways to do close reading to find specific answers. Finally, guided writing was initiated during the guided reading groups to allow the teachers to provide timely feedback and support to encourage persistence and high expectations.

In this example, by simply looking at student data, we could have identified the problem but not the root cause, and therefore we would not have identified the best corrective actions.

How do you validate the results of an RCA?

- **Isn't it more appropriate to call these *hypothesized* root causes, since you really can't tell something is a root cause until you conduct research/conduct an intervention to see if there are any changes to the outcome of interest?**

Yes, this could be another way to look at this step in the continuous improvement process.

³ http://en.wikipedia.org/wiki/Ishikawa_diagram

⁴ <https://rel-mid-atlantic.adobeconnect.com/a1117887765/p7s2sogpa8h/?launcher=false&fcsContent=true&pbM ode=normal>

- **How do you know you've identified a root cause? What if, even after going through the steps, you have identified an invalid or inauthentic root cause?**

The RCA process solves problems by attempting to identify and correct the root causes of events, as opposed to simply addressing their symptoms. Focusing correction on root causes has the goal of preventing problem recurrence. Root Cause Failure Analysis recognizes that complete prevention of recurrence by one corrective action is not always possible. Conversely, there may be several effective measures (methods) that address the root causes of a problem. Thus, RCA is an iterative process and a tool of continuous improvement.

RCA attempts to prevent schools from "identifying an invalid root cause" by using data, staff knowledge, and a drilling-down process to narrow the identification of causes. It also helps to eliminate guessing, and looking for a quick fix, rather than the root of the problem. However, there will be times when the identified root cause does not change the outcomes. Staff must attempt to re-examine their practices and the data to determine if the continuing problem is due to a misdiagnosis or a lack of knowledge as to how to address the issue. New sources of knowledge, support, and professional development can then be sought.

- **What if you've identified the root cause(s) but don't know or have the strategies or resources to effect change?**

The school can identify avenues of support for more training and professional development. In addition, leaders can collaborate with colleagues who have similar data or student needs to see what processes they have put in place. Staff can benchmark with other schools that have achieved success with similar populations and bring back new ideas. A school can also embark on a collaborative study of the literature that addresses the student need and/or bring in expert presenters who can provide support.

- **How are RCA findings shared with others so that lessons learned help others to identify and avoid the same issues or mistakes?**

Our School Improvement Plan is submitted to the central office. We talk about our plans at administrative meetings, schools share successes, videos of school collaborative practices are shared at principal and school team meetings, etc.

- **Is it possible that a root cause could be better addressed by the community or another organization (e.g., non-profit, government agency)?**

Community and other organizations are always an excellent support system, but the tenets of RCA call for analysis by the practitioners who are closest to the problem. Without being in the actual classrooms, it is difficult to identify exactly what the root cause is. Mind Tools, Ltd. states, "RCA assumes that systems and events (student needs) are interrelated. An action in one area triggers an action in another, another and so on. By tracing back these actions, you can discover where the problems started and how it affected the symptom you're now facing."⁵ This assumption is especially true in the school setting. Therefore, the teachers and staff who are facing the students every day need to be an integral part of the analysis and treatment of the problem.

⁵ http://www.mindtools.com/pages/article/newTMC_80.htm

Applicability of RCA to Other Scenarios

- **High school assessments**

RCA is especially valuable at the secondary level because so many staff interact with the same students every day. Without careful examination and questions by a cross-disciplinary team, issues and contributing factors are overlooked or never uncovered. High school students would also be a very important part of the team.

- **Measuring the effectiveness of professional development or of an instructional intervention**

We analyze our School Improvement Plan periodically during the year to ensure student success. A change in course may be necessary or additional resources or training may be needed to achieve goals.

- **Postsecondary education**

RCA could be implemented in postsecondary settings to address questions about enrollment, persistence, achievement gaps, etc., much in the same way RCA is used in K-12 settings.

- **Leadership development models**

As Director of Elementary Leadership in Montgomery County Public Schools (MCPS), I taught the RCA model to our rising administrators. At the time, MCPS also required all new principals to take a three-session course on RCA, using their actual student data, to develop a school-wide plan for improvement. It can be a very useful tool for developing leaders.

- **Doing research**

RCA could be done as a preliminary step to conducting a formal research study. For example, RCA could help identify research questions, determine appropriate study designs, select interventions, and target outcome measures.

Additional Resources

Barth, R., DuFour, R., Eaker, R., Eason-Watkins, B., Fullan, M., Lezotte, L., et al. (2005). *On Common Ground: The Power of Professional Learning Communities*. Bloomington, IN: Solution Tree Press.

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